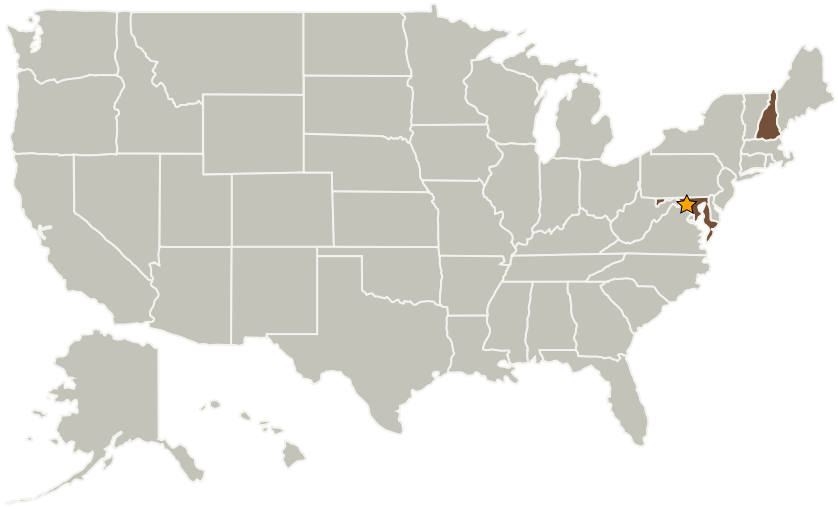
Very Low-Cost, Rugged, High-Vacuum System for Mass Spectrometers, Phase I

Completed Technology Project (2008 - 2008)

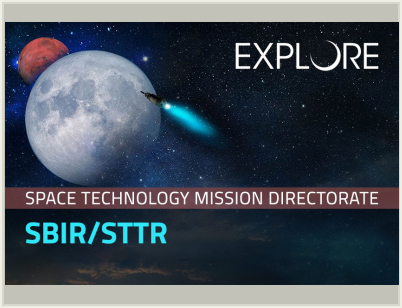
Project Introduction

NASA, DoD, DHS, and commercial industry have a pressing need for miniaturized, rugged, low-cost high-vacuum systems. Recent advances in sensor technology at NASA and other government laboratories, in academia, and in industry have led to the development of very small mass spectrometer detectors as well as other analytical instruments such as scanning electronic microscopes. However, the vacuum systems to support these sensors remain large, heavy, and power hungry. To meet this need, Creare proposes to build a miniaturized vacuum system based on a very small, rugged, and inexpensive to manufacture, molecular drag pump. The vacuum pump has performance that is well matched to the needs of these new generation miniature analytical instruments. Such a pump represents an order-of-magnitude reduction in mass, volume, and cost over current, commercially available, state-of-the-art vacuum pumps. The new pump will form the heart of a complete vacuum system optimized to support analytical instruments in terrestrial applications and on spacecraft and planetary landers.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Creare LLC	Supporting Organization	Industry	Hanover, New Hampshire



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
Maryland	New Hampshire

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Robert J Kline-schoder

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors